

TRACKS, TRACKWORK & CIVIL ENGINEERING

Boring the Hillsides

Tunnels and Tunnel Portals

by John Thomas

Tunnels occur in two main situations, under natural obstacles such as hills or mountains which are too high to penetrate with cuttings or they may be built under built-up areas, i.e. cities or towns.

Tunnels should never be built on a layout unless the terrain appears to justify them. Put a small hill in the middle of an otherwise flat plain and drive a tunnel through it and you immediately destroy any sense of realism. Not that the isolated hill on a flat plain does not occur in nature, such things do occur, but no engineer would tunnel under a hill when a slight deviation to the right or left would allow the track to continue on level ground.

If you want to have a tunnel on your layout it is better to make the surrounding country hilly or mountainous. Provide a convenient spur for the tunnel and make things look as though the tunnel had to be built. However, should you insist on having a tunnel on your layout and lack of space prevents you from making it look realistic, then who is to say you nay.

Tunnel portals vary from the simply practical to the highly ornate, depending largely on the whim of the builder. Whether the portal will have wing walls or not depends on the nature of the ground in which the tunnel is built. Where the ground is solid rock no wing walls are needed. In soft ground wing walls must be used to prevent the ground from collapsing and blocking off the tunnel entrance.

In model form, there are various tunnel portals both in HO/OO and in N Gauge. Most are plastic mouldings, some with wing walls & some without. Some of the types in the range of AMC Distributed Products are shown in the next column. Here is a list of them:-

HO/OO

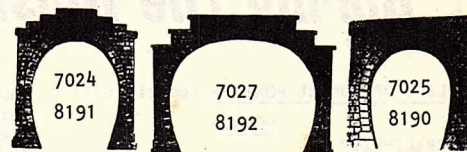
"BUSCH"

7024 Single Tunnel Portal, stepped top (2)

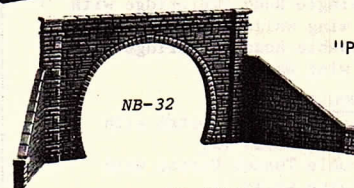
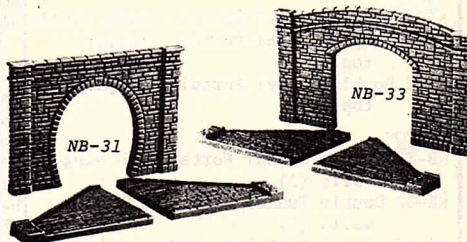
7025 Single Tunnel Portal, sloped top (2)

7027 Double Tunnel Portal, stepped top (2)

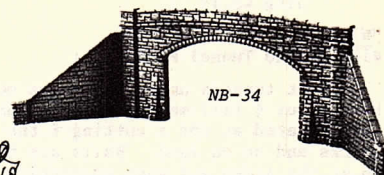
(continued on next page)



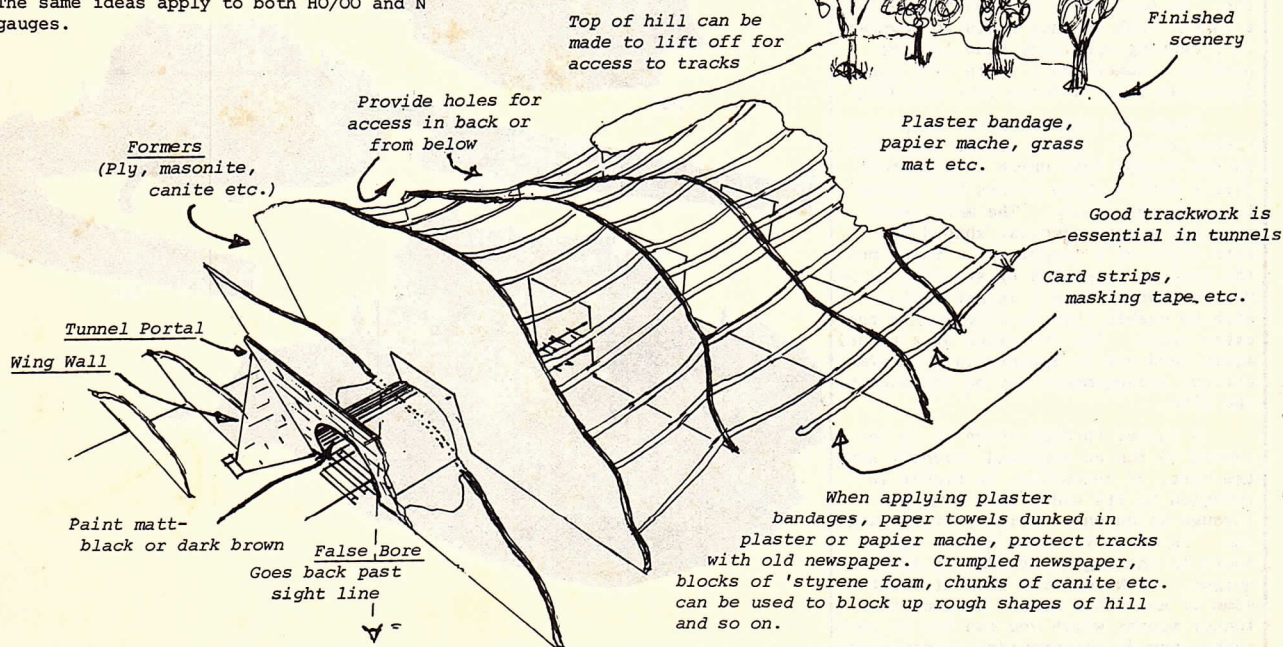
"BUSCH"



"PECO"



There is nothing very difficult about building a tunnel on your layout. The sketch below gives some ideas on how to go about it. The same ideas apply to both HO/OO and N gauges.



REMEMBER you must provide access to the inside of all tunnels for track maintenance and for removal of rolling stock in case of derailment.

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LIST OF TUNNEL PORTALS (continued)

HO/00

"BILTEEZI"

B-6 Single & Double Tunnel Mouths with retaining walls

N GAUGE

"BUSCH"

8190 Single Tunnel Portal, plain top(2)

8191 Single Tunnel Portal, stepped top (2)

8192 Double Tunnel Portal, stepped top (2)

"PECO"

NB-31 Single Tunnel Portal with wing walls (2)

NB-32 Double Tunnel Portal with wing walls (2)

NB-33 Single Road Overbridge with wing walls (2)

NB-34 Double Road Overbridge with wing walls (2)

"S.N. MOULDINGS"

7204 Single Tunnel Portal with wing walls (2)

7205 Double Tunnel Portal with wing walls (2)

"WIAD"

41B Single Tunnel Portal (2)

Most tunnels under towns are built by the cut & fill method. The ground is excavated as for a cutting & the tracks and so on laid. Walls are built up at the sides and when everything is completed the whole lot is roofed over and roads, buildings etc. erected on top. In many cases the track entering a tunnel such as this would go downward in a cutting specially made for the purpose. Sometimes a train will just disappear under a large city building.

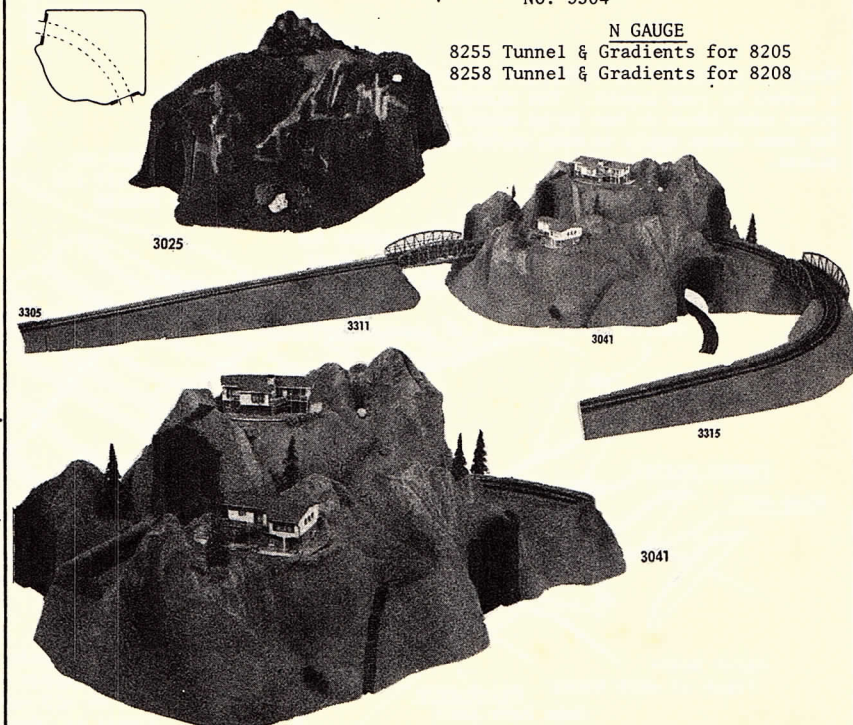
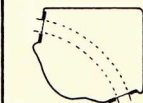
There are several basic shapes to tunnel mouths. There is the type used on the London Tube which is a perfect circle with a chord across the bottom to carry the tracks. The more usual type has a semi-circular shaped top with sides of a larger arc. Sometimes the arch is supported by straight walls. Double tunnels have a larger radius arch to enable them to accommodate the extra track. The two sides of a tunnel mouth need not be symmetrical. Unsymmetrical arrangements may be dictated by the site.

A tunnel through which it is intended to run an overhead catenary system must, of necessity, be higher in relation to its width than a tunnel through which only ordinary trains will run. In HO/00 you will need a tunnel mouth in the region of 90mm or more in height. In N you will need at least 45mm if not a bit more. Many of the tunnel mouths which you can buy at your hobby shop do not provide clearance for catenary. You can gain a little extra height by sitting the sides of the tunnel mouth on a footing. This should

not be more than a few millimetres high otherwise you will spoil the appearance of the tunnel mouth. Of the tunnel mouths listed on these pages, the double tunnel mouths with the exception of the N Gauge S.N. Mouldings will take catenary. None of the single tunnel mouths except Busch No. 7024 in HO/00 and No. 8191 in N will take catenary.

Derailments are almost certain to occur in the most inaccessible places on the layout so you must ensure when you build a tunnel that you can get your hands into it to remove derailed rolling stock and to carry out track maintenance. Access to tunnels can be had by making the top of the hill so that it lifts off, you can leave holes in the back through which you can put your hands or you can cut holes in the baseboard so that you can reach up from underneath. In the tunnel will be the hardest place to get at the track so you must ensure that this is the place where you do your best work when your are laying the track.

Points are best not put in tunnels as it is very discouraging to have to demolish a tunnel to make an adjustment to a sticky point.



The sketch on the previous page gives some ideas on building a tunnel on your layout. The same ideas apply to all gauges.

Apart from the tunnel mouths which have already been listed, there are also complete tunnels & gradients made by "Busch". These are plastic, ready coloured & flocked with grass. They are primarily designed for use with "Toporama" sheets, but may also be used on any free-lance model layout. Some of these are listed and illustrated below:-

HO/00

3025 Tunnel for Toporama No. 3502

3041 Tunnel for Toporama No. 3504

3301 Toporama Gradient 0-30mm

3305 Toporama Gradient 0-30mm

(right hand curve)

3306 Toporama Gradient 0-30mm

(left hand curve)

3311 Toporama Gradient 30-80mm

3315 Toporama Gradient 30-80mm

(right hand curve)

3316 Toporama Gradient 30-80mm

(left hand curve)

3553 Tunnel & Gradients for Toporama No. 3503

3554 Tunnel & Gradients for Toporama No. 3504

N GAUGE

8255 Tunnel & Gradients for 8205

8258 Tunnel & Gradients for 8208